

14.

Migration of Papilionidae at Rancho Grande, North-central Venezuela.¹

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(Plate I; Text-figure 1).

[This is one of a series of papers resulting from the 45th, 46th and 47th Expeditions of the Department of Tropical Research of the New York Zoological Society, made during 1945, 1946 and 1948, under the direction of Dr. William Beebe, with headquarters at Rancho Grande in the National Park of Aragua, Venezuela. The expeditions were made possible through the generous cooperation of the National Government of Venezuela and of the Creole Petroleum Corporation.]

[The characteristics of the research area are in brief as follows; Rancho Grande is located in north-central Venezuela (10° 21' N. Lat., 67° 41' W. Long.), 80 kilometers west of Caracas, at an elevation of 1,100 meters in the undisturbed montane rain forest which covers this part of the Caribbean range of the Andes. The migration flyway of Portachuelo Pass, which is also the water-shed between the Caribbean and Lake Valencia, is 200 meters from Rancho Grande. Adjacent ecological zones include seasonal forest, savanna, thorn woodland, cactus scrub, the fresh-water lake of Valencia and various marine littoral zones. The Rancho Grande area is generally subtropical, being uniformly cool and damp throughout the year because of the prevalence of the mountain cloud cap. The dry season extends from January into April. The average humidity during the expeditions, including parts of both wet and dry seasons, was 92.4%; the average temperature during the same period was 18° C; the average annual rainfall over a five-year period was 174 cm. The flora is marked by an abundance of mosses, ferns and epiphytes of many kinds, as well as a few gigantic trees. For further details see Beebe and Crane, *Zoologica*, Vol. 32, No. 5, 1947. Unless otherwise stated, the specimens discussed in the present paper were taken in the montane cloud forest zone, within a radius of one kilometer of Rancho Grande.]

For an account of Portachuelo Pass, together with a general introduction to the groups of migrating insects and migrating factors see "Insect Migration at Rancho Grande," by William Beebe, *Zoologica*, 1949, Vol. 34, No. 12, pp. 107-110.

In Volume 26 of *Novitates Zoologicae*, W. J. Kaye has a paper entitled "A Geographical Table to show the Distribution of the American Papilios." Under the heading "Venezuela, North," (pp. 352-355), the author lists thirty-one species. In a letter Dr. Rene Lichy of Caracas sends me a list of thirty-one species of this family which he

has collected in northern Venezuela. A continuation of this coincidence is that each list contains seven species not found in the other list.

Both lists contain all the species which we took migrating through Portachuelo Pass, with the single exception of *crassus* which Lichy does not mention.

In the limited width of twenty meters of Portachuelo Pass, and allowing a height of net reach of a maximum of five meters, we captured seventeen species of *Papilio*. This area may be considered, not unrealistically nor unconservatively, as, at the most, a millionth of the extent of north Venezuela. Yet within this relatively microscopic bit of Andean air, we secured almost half the papilios so far recorded from the entire northern part of the country. Thus, in the consideration of this family of butterflies, we are made to realize the wide-spread, impelling, migrational force affecting this group of insect life.

So much of this migration—its causes and extent—is at present unknown, that every verifiable fact is of value. Reviewing the known distribution of the seventeen species of *Papilio* migrants, we find that most of them extend from Mexico to Paraguay, south Brazil or Argentina. The distribution of the subspecies, however, presents a very different picture, and a very significant one in its over-all pattern. In twelve out of the seventeen, the subspecific range is confined to Colombia and Venezuela, with a few extensions to adjacent territory. Thus we may expect to find the northern point of origin of the movement of these forms a relatively short distance away.

The twelve subspecies of *Papilio* with limited distribution are as follows:

anchises osyris
anchisiades anchisiades
agesilaus agesilaus
arcas arcas
cleotas coroebus
erithalion zeuxis
lycophron hippomedon
paeon thrason
polyxenes americus
protesilaus archesilaus
sesostris tarquinius
torquatus orchamus

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The remaining five forms of *Papilio* with wider distribution are:

belus varus
crassus
phaon
polydamus polydamus
thoas neacles

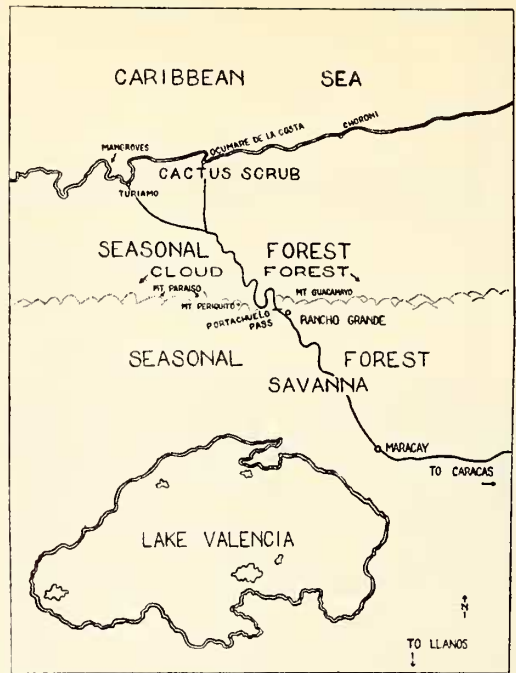
Let us take as an example *Papilio agesilaus agesilaus* or, as I called it before identification, Small Zebra Swallowtail. I recorded seven individuals captured and fifty-eight seen with certainty. Added to this number were the many papilios glimpsed too briefly, flying too high or too fast to be recognized as to species, and also those which must have passed during the hours of our absence from the pass. It was heartbreaking to realize what a minute fraction we could honestly record by sight identification, yet there is no other way, at present known, to glean definite, general knowledge of this phase of the lives of these splendid insects. Without exception, all sight-named species were subsequently confirmed or discarded by comparison with captured, definitely classified specimens.

In this as in some other species, the small number of records from the year 1946 and their entire absence from 1945 by no means indicates the absence of the species on migration, but only reflects our non-recognition of the importance of the Portachuelo Pass migration during the early years, and consequent slight attention paid to this phenomenon. An ultimate summary of the relatively few, disconnected observations made during 1945 and 1946 reveals a general movement on a scale equal in magnitude and as all-embracing of insect orders as we recorded during 1948.

The mere recording of the capture of seventeen species of *Papilio* on migration is a worth-while fact, and when more and more individuals are taken on succeeding days and weeks the phenomenon is enhanced in interest. In few or in large numbers the insects continue to fly past, slowly or circling or alighting out of reach. As in the case of many other organisms, the time has come when sight records must be used to supplement specimens in net, envelope and cabinet. Ornithologists in general and British entomologists in particular have gone far in sight identifications, while at the same time maintaining as perfect accuracy as possible with man's fallible eyesight and only too human brain.

At the end of our many months of collecting and observation at the pass, I found, in my Journal, a significant assemblage of shorthand names of papilios. They were, of course, essentially personal, stimulated by mental comparisons with swallowtails familiar to me elsewhere, or in the case of strange tropical forms, by outstanding wing shapes, size, patterns and colors.

Lepidopterists recognize three "natural groups" into which papilios may be divided.



TEXT-FIG. 1. Map showing location of Rancho Grande, Portachuelo Pass and surrounding territory.

These are based on various factors such as larvae, pupae, microscopical imaginal distinctions and/or food-plants. Our migrant species fit into these three groups as follows: **ARISTOLOCHIA:** *sesostris*, *erithalion*, *anchises*, *arcas*, *polydamus*, *belus* and *crassus*. **FLUTED:** *polyxenes*, *thoas*, *paeon*, *lycophron*, *anchisiades*, *torquatus* and *cleotas*. **KITE:** *phaon*, *agesilaus* and *protesilaus*.

Consideration of this arrangement shows no logical, technical or scientific agreement. This is only to be expected in sight identification, which can take no account of sexual relationships, or parallelisms, or the superficial resemblance brought about by mimicry.

After final identification of the seventeen species of *Papilio* migrants, I arranged mounted specimens of all in a large insect drawer, placed this upright on a chair in good light and studied them from a distance of ten meters. From this distance I made the following key:

A—WHITE AND BLACK

- a—Small: *agesilaus agesilaus*
 b—Large: *protesilaus archesilaus*

B—YELLOW AND BLACK

- a—Yellow-banded
 Broad-band-plus-spot, small: *torquatus*, *orchamus*, male
 Broad-band, medium: *lycophron hippomedon*, male
 Narrow-band: *paeon thrason*
thoas neacles

- b—Yellow-spotted
 Small: *polyxenes americanus*
 Medium: *polydamus polydamus*
 Large: *cleotas coroebus*

C—RED AND BLACK (Hindwing)

- a—Cream-spot-forewing
sesostris tarquinius, female
erithalion zeuxis, female
anchises osyris, female
arcas arcas, female
torquatus orchamus, female

- b—Green-spot-forewing
erithalion zeuxis, male
anchises osyris, male
arcas arcas, male

- c—Black-forewing
anchisiades anchisiades

D—GREEN AND BLACK

- a—Green-forewing
sesostris tarquinius, male

- b—Green-hindwing
phaon

E—BLACK (Dominantly)

- belus varus*
crassus
lycophron hippomedon, female

I compared this key with the names made up on the spot in the field, and found a gratifying agreement in species recognition. The differences were chiefly substitution for patterns and colors of the names of northern species suggesting resemblances, species with which I had long been familiar in the eastern United States. For example, *agesilaus agesilaus* was "small ajax or zebra," *polyxenes americanus* was "small asterias," and *thoas neacles* was "cresphontes-like," etc.

I cite all this as in no way directly possible or in the same detail applicable for use by another observer, but merely to show a framework upon which can successfully be erected an observer's sight key. Further comments, in greater or less detail, will be found under the treatment of many of the species.

My special thanks go to Mr. Henry Fleming, entomologist of our Department of Tropical Research, for many direct observations and for frequent corroboration of my own. In addition I am beholden to him for looking up distribution data and for painstaking identification of all the species.

***Papilio anchises osyris* Felder.**

Species Range: Colombia to Brazil, Bolivia and Paraguay.

Subspecies Range: Venezuela.

Field Characters: Both male and female indistinguishable in the field from *erithalion zeuxis*. Therefore all specimens observed and not taken are combined under the two species. Compared with *arcas arcas* the male lacks bright green forewing spot, and the female has a decidedly larger, 4-celled forewing cream spot.

Number and Sex: Both sexes taken; eight males, five females.

Date: April 13 to July 29.

Condition: All taken were fresh.

Record of Captures: 1945—July 15 (male), 18 (female). 1946—April 13 (male, km. 20). 1948—April 29 (male); May 1 (female), 31 (female); June 6 (male and female); July 17 (male, km. 30), 23 (male, km. 15), 29 (female at Pass, 2 males, km. 35).

Combined Sight Records: *anchises* and *erithalion*: (Total 62). 1946—May 27 (4 females); June 29 (2 females). 1948—May 26 (4 females); June 4 (11 females passed in 10 minutes), 15 (4 females resting on shrubs), 22 (5 seen); July 2 (12 females), 9 (14 males, 3 females), 29 (3 females).

***Papilio anchisiades anchisiades* Esper.**

Field Name: Red-spot Black.

Species Range: Mexico to southern Brazil.

Subspecies Range: Colombia to Bolivia and Para (Brazil).

Field Characters: Black with red on hindwing. Closest in field appearance to wholly black *lycophron hippomedon*.

Number: 2 specimens taken, a male and a female.

Notes: This black-forewing-red-hindwing papilio came through the Pass with what were taken and identified as female *arcas arcas* and *anchises osyris*, all captured together.

Record of Captures: A male in frightfully worn condition collected on April 13, 1945, No. 45456. A second individual, a female, taken at the Pass May 1, 1948, No. 48474.

***Papilio agesilaus agesilaus* Guerin.**

Field Name: Small Black-and-white Zebra Swallowtail.

Species Range: Mexico to Paraguay.

Subspecies Range: Magdalena Valley, Colombia, to northern Venezuela.

Field Characters: Unmistakable resemblance to our northern ajax or zebra. The only optically related species is *protesilaus archesilaus*, but the present species is much smaller (forewing 43 mm. as compared with 53 mm.). The difference easily recognizable when either species is close at hand or near other butterflies.

Number: Total recorded 58. Seven taken (48543, 48731, 481344, 481494).

Sex: Both sexes taken.

Date: From April 29 to July 26.

Frequency: Recorded on seventeen days. Moderately but markedly gregarious. Two-thirds of *agesilaus* were recorded in groups of 4 to 8, while one-third appeared singly or in twos.

Flight: Except when alarmed or fighting against a strong head wind, the flight was unhurried and wavering, always steadily south.

Condition: With one exception all that I saw hovering or resting at the Pass were in

good condition, with both long slender tails visible to the naked eye or through three-power binoculars. No. 481344, taken July 26, 1948, at kilometer 16, was badly mutilated, with one tail missing. Dissection revealed that this male had already mated.

Record: 1946—May 26 (2 seen), 27 (2 at Pass, 3 at km. 20), 30 (6 singly). 1948—April 29 (2); May 14 (1 taken), 21 (4 seen, 1 taken), 23 (1 taken), 24 (4), 26 (4), 31 (8); June 6 (1), 17 (2 taken), 19 (2); July 13 (4), 16 (2), 23 (1 taken km. 16), 24 (6), 26 (1 at Pass, 1 at km. 16).

Papilio arcas arcas Cramer.

Field Name: Green-spot (male). Two-celled-cream-spot (female).

Species Range: Mexico to Colombia, Venezuela and the Guianas.

Subspecies Range: Venezuela and the Guianas.

Field Characters: Closest to *anchises* and *erithalion*, from which it differs in the bright green forewing spot in the male, and the smaller, two-cell forewing spot in the female. It is also close to the exceedingly rare *torquatus orchamus*. From the male *sesostris tarquinius* this species differs in the red on the hindwing.

Number: Total recorded 277. Twenty-one taken.

Sex: Both sexes taken. In 1946 only females were seen or taken. In 1948 females were dominant from May 1 to June 17, and males from July 6 to July 22.

Date: May 1 to July 22.

Frequency: Recorded on 20 days: 1 (15 times), 2 (4 times), 4 (once), 6 (twice), 7, 13, 14, 16, 18, 29 and 85. Decidedly gregarious, occurring singly and in twos nineteen times, comprising one-fourteenth of the total number passing in larger numbers—from 4 to 85. As mentioned above, the sexes showed a decided segregation. The flocks were usually compact waves.

Flight: Rather low and fluttering.

Condition: Most of *arcas* observed were in fresh condition, decidedly unworn.

Extent of Migration: On four separate days specimens of this species were taken both at the Pass and at kilometer 20, well to the south, and at kilometer 35, half way to the coast to the north.

Record: 1945—July 3 (3 taken), 16 (2 seen, 1 taken, Limon). 1946—May 28 (27 seen, 2 taken), 29 (7 at Pass, 6 at km. 20), June 4 (female), 22 (female); September 7 (84 in half an hour, 1 taken). 1948—May 1 (female), 4 (6 females), 5 (male), 28 (female) 29 (female); June 6 (2 males, flock of 18 females), 17 (16 females flying low), 22 (male and female), 28 (28 females); July 6 (2 males), 9 (male caught and eaten by bat falcon, 21 males seen), 14 (7 males), 15 (11 males, 3 taken), 16 (13 seen, four fighting in midair), 19 (4 males, 1 taken km. 15), 22 (2 males, 1 taken km. 35).

Papilio belus varus Kollar.

Species Range: Mexico to Bolivia and Para (Brazil).

Subspecies Range: Guatemala to northern Venezuela and Ecuador.

Dichromatic Female, form *latinus* Felder.

Field Name: Greenish-hindwing-band Black.

Field Characters: Black, with a curved band of large, yellow-green spots on hind wing.

Number: Total recorded 19. Eight taken.

Sex: Females only taken.

Date: May 29 to August 4.

Frequency: Taken singly. Five once seen together.

Condition: Fresh.

Record: 1946—July 7 (1 seen km. 20). 1948—May 29 (1 seen); July 4 (4 seen at 8:30 A.M.), 14 (1 taken), 16 (3 taken), 21 (2 taken, 3 seen), 26 (1 taken, 2 seen km. 16); August 4 (1 taken).

Dichromatic Female, form *varus* Kollar.

Field Name: Cream-spot-forewing Black.

Field Characters: Irregular splash of yellow in forewing; hindwing blue-black.

Number: Total recorded 18. Three taken.

Sex: Females only taken.

Date: May 30 to July 26.

Frequency: On two occasions, five were seen together.

Condition: Fresh.

Record: 1948—April 29 (1 taken); May 30 (5 seen); July 8 (3 seen), 9 (2 seen alighted, 2 taken, 5 seen km. 31).

Papilio cleofas corcebus Felder, form *dione* Rothschild and Jordan.

Field Name: Large Asterias Swallowtail.

Species Range: Costa Rica to Brazil.

Subspecies Range: North Colombia and Venezuela.

Field Characters: Rather like a very large Asterias, or *polyxenes americanus*, with forewing 67 mm. as compared with 40 mm. A very distinct species.

Number: Total recorded 19. One taken.

Sex: The single specimen taken was a female.

Date: May 26 to July 17.

Record: 1948—May 10 (4 seen), 26 (2 seen); June 6 (female taken, 2 others flying in company with three of the small *polyxenes americanus*); July 10 (2 at Pass, 2 at km.15), 17 (3 at Pass, 3 at km. 30).

Papilio crassus Cramer, male form *lepidus* Felder.

Field Name: Black Philenor.

Species Range: Costa Rica south to Brazil.

Field Characters: Wholly black except for concealed bluish-white anterior border of hindwing.

Number: Total seen 23. One taken.

Record: A single male specimen of the form *lepidus* taken on July 21, 1948, No. 481538. Twenty more, distinctly seen, passed

at the same time, all out of reach. On the following day, July 22, two more of these black papilios were seen. No other record.

***Papilio erithalion zeuxis* Lucas.**

Species Range: Costa Rica to Colombia and northern Venezuela.

Subspecies Range: North Venezuela and Colombia.

Field Characters: Both sexes indistinguishable from *anchises osyris*. Differs from *arcas arcas* in male lacking forewing green spot, and female with larger, 4-celled forewing cream spot.

Number: Total number taken 14.

Sex: Both sexes taken.

Date: June 29 to July 24.

Condition: All freshly emerged.

Record of Captures: 1945—July 3 (female taken, Limon). 1946—June 29 (female, km. 20); July 7, 8 and 10 (Each day 1 female taken, km. 20). 1948—July 9 (3 males, km. 31), 14 (male), 15 (male), 17 (2 females), 23 (female, km. 15), 24 (female).

For joint sight identification records with *anchises osyris*, see under latter species.

***Papilio lycophron hippomedon* Felder.**

Field Name: Male, Broad-band Medium Turnus. Female, Black Troilus-like Swallowtail.

Species Range: Mexico south to Argentina and Uruguay.

Subspecies Range: Colombia and northern Venezuela.

Field Characters: Male can be confused only with the very rare, smaller, yellow-spot *torquatus orchamus*; female recalling a melanistic *troilus* or *phaon* with black hindwings.

Number: Total recorded 20. Eight taken.

Sex: Both sexes taken.

Date: May 10 to July 20.

Record: 1946—May 27 (2 at Pass, 2 km. 20, all males). 1948—May 10 (3 males seen), 21 (female taken), 23 (male taken), 24 (male taken), June 6 (2 females taken), 17 (2 males taken), 29 (4 males seen); July 10 (male seen), 20 (male taken).

***Papilio paeon thrason* Felder.**

Field Name: Rare Cresphontes-like Swallowtail.

Species Range: Mexico south to Argentina and Uruguay.

Subspecies Range: North Colombia and Venezuela.

Field Characters: Indistinguishable in the field from *thoas neacles*, but as only a single specimen of *paeon thrason* was taken, compared with more than one hundred of *thoas*, I am assuming that all Cresphontes-like papilios observed were of the more abundant species.

Record of Capture: A single male taken on May 23, 1948, No. 481539, in extremely torn and worn condition. It was captured at the Pass at 12:30 P.M., the day being

warm and sunny with a Force 4 wind from the south.

***Papilio phaon* Boisduval, aberration
metaphaon Butler.**

Field Name: Philenor-like Swallowtail.
Species Range: Mexico to Ecuador and Venezuela.

Field Characters: This is the only black papilio with green on the hind wings.

Number: Total recorded 254. Seven taken.

Sex: Both sexes taken.

Date: April 13 to July 21.

Record: 1945—May 24 (1 taken). 1946—(September 9, numbers of these black papilios with large green spot on the hind wings were flying too high to catch. Several alighted and allowed detailed study with Number three glasses. Counted 228 and missed many more.) 1948—April 13 (male taken km. 20), 16 (male taken), 27 (male taken, km. 20), 29 (female taken at Pass); July 21 (2 taken, 19 seen).

***Papilio polydamus polydamus* Linnaeus.**

Field Name: Medium Asterias Swallowtail.

Species Range: South Atlantic states, West Indies and south to Argentina.

Subspecies Range: Georgia south to Buenos Aires.

Field Characters: Differs to the eye from *polyxenes americanus* in the field by the single instead of double line of yellow spots across all wings. Another distinction is the larger size.

Number: Total recorded 177. Nine taken.

Sex: Both sexes taken.

Date: May 15 to July 26.

Frequency: Decidedly gregarious. One-eighth passed singly or in a scattering up to five individuals. Seven-eighths were observed in flocks of ten to forty-eight.

Record: 1946—May 27 (2 seen). 1948—May 15 (5 seen), 29 (female taken); June 6 (female taken), 22 (11), 30 (female taken, 48 passing, 2 seen at km. 21). July 9 (female taken), 10 (2 males taken, 16 seen. 2 taken km. 31), 11 (14 flurry, 1 single), 14 (1 taken, 23 seen), 17 (10 seen km. 30), 18 (3), 19 (3), 22 (3 km. 35), 26 (27 seen).

***Papilio polyxenes americanus* Kollar, form
melasina Rothschild and Jordan.**

Field Name: Small Asterias Swallowtail.
Species Range: Canada south to Cuba and Peru.

Subspecies Range: Colombia, Venezuela and northern Peru.

Field Characters: Under a new name this proved to be the same species as our northern Asterias. The only other resembling migrant butterfly was the markedly larger *polydamus polydamus*.

Number: Total observed 34. Although observed on ten occasions during two seasons, only three specimens were taken.

Date: March 25 to July 20.

Frequency: 1, 1, 1, 2, 2, 2, 3, 3, 3, 6, 6.

Note: Three perfect specimens on June 5, after rain, clung to the extreme ends of large leaves. The wings were flat and expanded, with the fore edge straight across so that the transverse band and spots were continuous.

Record: 1946—March 25 (1 taken, km. 21); April 19 (1 taken, km. 21); May 28 (2 seen at Pass). 1948—April 29 (3 seen); May 4 (6 flying together), 28 (2 seen); June 5 (3 seen), 6 (3 seen); July 19 (6 seen), 20 (1 taken at Pass), 22 (6 seen at km. 35).

***Papilio protesilaus archesilaus* Felder.**

Field Name: Large Zebra Swallowtail.

Species Range: Mexico to Paraguay.

Subspecies Range: Colombia, northern Venezuela and western Ecuador.

Field Characters: Larger than (forewing 53 mm. as compared with 43 mm.) but in general similar to *agesilaus*. Size difference quite apparent when near, but not when flying high, away from other known butterflies. At least fifteen individuals were not counted because of uncertain sight identification.

Number: Total recorded 42. Three taken (48543).

Sex: Males only were taken. The female seems to be quite unknown.

Date: Recorded on migration from April 29 to July 19.

Frequency: The relative gregariousness corresponds to that in *agesilaus*. More than five-sixths were in 4 to 12 groups, and six only seen as solitary or dual migrants.

Condition: All observed in detail appeared fresh and perfect.

Additional Notes: The flurry of 12 large zebras on May 30, were in a compact body, and at a time when neblina and rain, while light, were continuous enough to discourage all other migrants. Yet these great swallow-tails flew steadily at a height of about 12 feet, up to and through the Pass and down into the fog on the south slope.

The actions of six which passed on May 26 were typical. All flew slowly and with slightly wavering flight at 10 feet, until I swooped futilely at them with the net when all swerved sharply out and down, two penetrating the underbrush and working their way separately through the Pass before rising into the free air again. Three were followed with the glasses far down the south slope.

Record: 1946—May 27 (1 seen, 1 at km. 20), 29 (4 seen, 1 taken). 1948—April 29 (4); May 1 (3), 4 (1 taken), 10 (1), 21 (5 seen, 1 taken), 26 (6), 30 (12); July 19 (1 at Pass, 1 at km. 15).

***Papilio sesostris tarquinius* Boisduval.**

Field Name: Male, Green-spot Black.

Species Range: Mexico to Bolivia and central Brazil.

Subspecies Range: Panama, Ecuador, northern Venezuela.

Field Characters: Male to be confused only with male *arcas arcas*, but wholly lacks the hindwing red.

Number: Total recorded 39. Three taken.

Sex: Males only taken.

Date: April 30 to July 20.

Frequency: 1, 4, 5, 6, 23.

Condition: All freshly emerged.

Record: 1948—April 30 (1 taken); June 10 (4 seen), 17 (6 seen), 22 (22 seen, 1 taken); July 20 (4 seen, 1 taken).

***Papilio thoas neacles* Rothschild and Jordan.**

Field Name: Common Cresphontes-like Swallowtail.

Species Range: Texas to Buenos Aires.

Subspecies Range: Nicaragua to Ecuador, Venezuela, Trinidad and the lower Orinoco.

Field Characters: Cresphontes-like. Unidentifiable, even at close range, from *paeon thrason*, but only a single specimen of the latter was taken in two years of collecting.

Number: Total recorded 105. Nine taken.

Sex: Both sexes taken.

Date: May 4 to September 8.

Frequency: Usually seen passing in small groups, five to eight, maximum sixteen. Strong flyers, difficult to capture, but occasionally alighting, affording opportunity for a good look.

Record: 1946—May 4 (male taken, km. 20), 27 (16 seen); July 7 (female taken, km. 20); September 8 (3 seen). 1948—April 29 (3 seen), 30 (3, km. 26, headed for Pass); May 1 (4), 10 (2), 11 (2), 15 (4 seen, 1 taken), 23 (8 seen, male taken), 26 (6), 31 (1 seen); June 6 (3 taken, male, 2 females. Eggs protruding from females), 10 (5), 18 (8), 22 (6), 29 (4), 30 (5); July 2 (5 seen), 9 (2 at Pass, 6 km. 31), 13 (male taken), 19 (3 seen, 1 taken km. 18).

***Papilio torquatus orchamus* Boisduval.**

Field Name: Male, Small Yellow-Band-and-Spot. Female, mimic of *arcas*.

Species Range: Mexico to Bolivia, Brazil and Paraguay.

Subspecies Range: Colombia and northern Venezuela.

Field Characters: Male somewhat similar to but smaller than male *lycophron hippomedon*; female very close to female of *arcas arcas*. The large, separate, anterior yellow spot on forewing of the male distinguishes it from the solid band of *lycophron*.

Number: Two males were seen, and two females taken.

Sex: Both sexes seen, female only taken.

Dates: May 1 to July 2.

Record: On May 1, 1948, I watched two new papilios fighting in the Pass. One flew down and alighted just out of reach, and the other soon followed. I made a detailed description of them, recording them as yellow-

banded-with-spot, tailless papilio. Not until our return north were we able to identify the insects by comparison with a male *torguatus* taken at Caripito.

On May 26 and again on July 2, 1948, a female was taken. These were badly rubbed and torn, whereas the males I saw were freshly emerged.

EXPLANATION OF THE PLATE.

PLATE I.

Seventeen species of butterflies of the genus *Papilio* taken as migrants at Portachuelo Pass, Rancho Grande, north-central Venezuela.

- Fig. 1. *sesostris tarquinius* (male).
 Fig. 2. *sesostris tarquinius* (female).
 Fig. 3. *erithalion zeuxis* (male).
 Fig. 4. *erithalion zeuxis* (female).
 Fig. 5. *anchises osyris* (male).
 Fig. 6. *anchises osyris* (female).
 Fig. 7. *arcas arcas* (male).
 Fig. 8. *arcas arcas* (female).
 Fig. 9. *polydamus polydamus*.
 Fig. 10. *belus varus* form *latinus*.
 Fig. 11. *belus varus* form *varus*.
 Fig. 12. *crassus* form *lepidus*.
 Fig. 13. *polyxenes americus* form *melasina* (male).
 Fig. 14. *polyxenes americus* form *melasina* (female).
 Fig. 15. *thoas neacles*.
 Fig. 16. *paeon thrason*.
 Fig. 17. *lycophron hippomedon* (male).
 Fig. 18. *lycophron hippomedon* (female).
 Fig. 19. *anchisiades anchisiades*.
 Fig. 20. *torquatus orchamus* (male).
 Fig. 21. *torquatus orchamus* (female).
 Fig. 22. *cleotas coroebus* form *dione*.
 Fig. 23. *phaon* aberration *metaphaon*.
 Fig. 24. *agesilaus agesilaus*.
 Fig. 25. *protesilaus archesilaus*.